

I Claim

1. An apparatus for transmitting user data blocks comprising a means for comparing the peak output of a transmission data block to a constant based on the dynamic range of a power amplifier, a means for dividing any transmission data block that has a peak output greater than the chosen constant into two or more segments, a transmitter for transmitting said segments individually to a receiver.

2. The apparatus according to claim 1 wherein one or more indicators are provided to notify the receiver that the original transmission data block should be reconstructed from said segments.

3. The apparatus according to claim 2 wherein there is a distinction between the signal representation used for the indicators and that used for the data being transmitted.

4. The apparatus according to claim 3 wherein the data is binary and the indicator is non binary.

5. The apparatus according to claim 4 wherein said indicator is a 0 when the data is comprised of +1's and -1's.

6. The apparatus according to claim 2 wherein the segments are transmitted in a transmission data block and said indicators may be included in said data block.

7. The apparatus according to claim 6 wherein when one or more segments are interspersed with indicators, the total amount of information must fill a full transmission data block.

8. The apparatus according to claim 1 wherein two or more segments from different user data blocks may be transmitted together, in the same transmission data block.

9. The apparatus according to claim 8 wherein the segments comprising the transmitted data block are selected in a cyclic order.

10. The apparatus according to claim 9 wherein said receiver is adapted to reconstruct user

data blocks based on said indicator.

11. The apparatus according to claim 10 wherein said receiver may also reconstruct user data blocks based on the order in which said segments are transmitted.

12. The apparatus according to claim 11 wherein when one of the divided segments from a user data block is transmitted along with indicator information as a single transmission data block, the next transmission data block comprises the remaining segment or segments without indicators.

13. The apparatus according to claim 12 wherein the next data block to be transmitted further includes one or more segments from another user data block.

14. The apparatus according to claim 1 wherein the transmitter is adapted such that all segments separated from said user data blocks have a power output less than the dynamic range of said power amplifier.

15. The apparatus according to claim 2 wherein said segments are defined by bit positions selected from said user data blocks and determine bit positions in transmitted data blocks.

16. The apparatus according to claim 15 wherein said indicators, when used, are placed in predetermined positions in transmitted data blocks.

17. The apparatus according to claim 16 wherein a majority of the indicators in said transmitted data blocks constitute a means for a receiver to diminish the effects of receive errors.

18. The apparatus according to claim 17 wherein groups of segments may be compared by a receiver to determine the type of indicator(s) transmitted, if any.

19. The apparatus according to claim 18 wherein the comparison groups are determined by the bit positions of said segments.

20. The apparatus according to claim 8 wherein there is an independent memory means for each of said segments in a data block.

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22. A system for reduction of Peak-to-Average Power Ratio Effects in Orthogonal Frequency-Division Multiplexing Modulation comprising

(b) a means for determining which symbols in a symbol space have a PAPR greater than said constant;

(d) whenever PAPR requirements can be met, a means of packing transmitted symbols to capacity with user information, without destroying the order of user information at the output of the receiver;

23. A system for reduction of Peak-to-Average Power Ratio Effects in Orthogonal Frequency-Division Multiplexing Modulation comprising a transmitter for transmitting an OFDM signal, one or more amplifier stages, and a receiver for demodulating said signal, further comprising

(b) a means for determining which symbols in a symbol space have a PAPR greater than said constant;

(d) whenever PAPR requirements can be met, a means of packing transmitted symbols to capacity with user information, without destroying the order of user information at the output of the receiver;

(e) a receiver adapted to analyze comparison groups to determine which received bit positions contain user data and which contain zeroes;

24. The system according to claim 23 wherein an Inverse Fast Fourier Transform is used to create the OFDM signal and the Fast Fourier Transform is used to demodulate the OFDM signal.

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